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*delphinodonta*, and *N. proxima*, from the coast of Maine, is given by Dr. G. A. Drew.<sup>1</sup> The mantle of *Yoldia* is supplied with two pairs of sense organs and a fringe of marginal tentacles. There is also an unpaired extensible siphonal tentacle which is protruded upon the surface of the mud in which the animal is buried. Development shows that this is homologous with the marginal tentacles. The foot of all the forms studied serves as a burrowing organ, not as a structure for creeping, as has often been supposed. The palps are active collectors of food, and the gills in *Yoldia* are very efficient pumping organs. The otocysts are provided with degenerating canals which lead toward the surface, and the genital ducts join the outer, not the inner, ends of the excretory organs. The eggs of *N. delphinodonta* are carried in cases of mucus-like material, while those of the other two species are cast free in the water. The embryos of the first-named species have no locomotor bands, and a feeble apical cluster of cilia, and their development is less rapid. The species of *Nucula* agree with *Yoldia*, which has been most fully studied,<sup>2</sup> in the formation of an ectodermal "test" which is afterwards cast off. From this primitive covering the definitive ectoderm, the nervous system, and the stomodæum are formed. The openings of the proctodæum and stomodæum are close together in the region of the primitive blastopore. At the time of metamorphosis the stomodæum, from its primitive opening to the position of the adult mouth, is cast off, together with a part of the apical plate. The test of these protobranchs is held to be the homologue of the velum of the molluscan larva, which has developed from ancestors resembling the embryos of *Yoldia* and *Nucula* in form and structure. *Chiton*, *Teredo*, *Cardium*, and *Polydordius* are known to cast away the velum of the larval stage. The test of the protobranchs is strikingly similar to that found by Pruvot on the embryo of *Dondersia* one of the primitive group of *Solenogastres*.

C. A. K.

**Innervation of the Pharynx.** — The innervation of the laryngeal muscles is an important point in settling their homologies with the muscles of the branchiate vertebrates. The usual statement is that the *recurrens* nerve supplies all the muscles except the *M. cricothy-*

<sup>1</sup> Drew, G. A. Some Observations on the Habits, Anatomy, and Embryology of Members of the Protobranchia, *Anat. Anz.*, Bd. xv, Nr. 24 (1899), pp. 493-519. With 21 figures.

<sup>2</sup> Drew, G. A. *Yoldia limatula*, *Mem. Biol. Lab. J. H. Univ.*, vol. iv, No. 3 (1899), 37 pp., 5 pls.

*reoideus*. Neumayer has recently published the results of his studies.<sup>1</sup> He finds that (1) the *recurrens* supplies the muscles cricoarytenoideus posticus and lateralis and the thyreoarytenoideus; (2) the *recurrens*, together with the laryngeus superior, innervate the interarytenoideus transversus and obliquus, the aryepiglotticus and the muscles of the false vocal cord; (3) the cricothyreoideus is supplied by the laryngeus superior.

**Holland's Butterfly Book**<sup>2</sup> is what its title claims, "a popular guide to a knowledge of the butterflies of North America," and compares very favorably with the numerous books upon butterflies published in England and on the continent. The forty-eight plates are, as a whole, excellent, and will enable an amateur to identify a very large proportion of the butterflies he may collect. The scientific value of the illustrations would have been enhanced if the species figured from the original types had been indicated. The text cannot be regarded as a contribution to science, and the essentially popular character of the work in no way justifies the flippant and egotistical style employed. With "the entire literature relating to the subject" at command, strictly scientific data, such as the distribution of the species, should have been stated more accurately and in greater detail.

The book is sold at a very reasonable price, and it is hoped that its sale will enable Dr. Holland to carry out his intention and issue a similar volume upon the moths of North America. This is even more needed than *The Butterfly Book*.

**Embryos of Bdellostoma.**— Franz Doflein describes<sup>3</sup> several embryonic stages of *Bdellostoma* which he obtained at Pacific Grove, California. Before oviposition the eggs lie in a fold of the mesovarium which increases in size and becomes richly vascular and forms a complicated follicle apparatus. The characteristic hooks do not appear until the eggs have reached their full size. They are then formed in pockets of the follicular apparatus, the rest of which forms the horny shell. Only a small per cent of the eggs taken are fertilized, and apparently fertilization takes place outside the mother. The embryo appears on the flat side of the egg, the head being towards the opercular pole. Doflein describes, and his figures show

<sup>1</sup> *Sitzungsber. Gesell. Morph. und Physiol.*, vol. xiv, p. 142, München, 1899.

<sup>2</sup> Holland, W. J. *The Butterfly Book*. A popular guide to a knowledge of the butterflies of North America. New York, Doubleday & McClure Co., 1898. xx + 382 pp., 8vo, 48 colored plates and text-figures.

<sup>3</sup> *Sitzungsber. Gesell. Morph. und Physiol.*, vol. xiv, p. 105, München, 1899.